



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/509,121	03/23/2000	HIDEKAZU KOBAYASHI	105034	3415

25944 7590 07/31/2002

OLIFF & BERRIDGE, PLC
P.O. BOX 19928
ALEXANDRIA, VA 22320

EXAMINER

ROY, SIKHA

ART UNIT PAPER NUMBER

2879

DATE MAILED: 07/31/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/509,121

Applicant(s)

KOBAYASHI, HIDEKAZU

Examiner

Sikha Roy

Art Unit

2879

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 March 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) _____ is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 15-42 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

The Preliminary Amendment (Paper # 5), filed on March 23, 2000, has been entered and is acknowledged by the Examiner.

Specification

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 17, 18 and 30, 31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The limitation in claims 17,18,30 and 31 reciting “fluoride of an oxide” of alkali metal, an alkaline earth metal and group III element does not clarify whether it is the fluoride or oxide of the element is considered and hence renders the claims indefinite. The specification also fails to provide any details of the compounds used for the thin film layer. For examination purpose, “the fluoride or oxide of alkali metal, alkaline earth metal and group III elements have been considered.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

Claims 15-19, 28-32 are rejected under 35 U.S.C. 102(b) as being anticipated by U. S. Patent 5,739,635 to Wakimoto.

Referring to claim 15 and 28 Wakimoto discloses (column 2 lines 1-10,53-58, Fig. 3) an electroluminescent device comprising a light emitting layer 3 including organic polymer (organic compound such as dicyanomethalene derivatives, quinacridone derivatives) emitting light in the visible spectrum between the anode2 and cathode 1 and a thin film layer 6b (electron-injecting layer of an insulating thin film) disposed between the light emitting layer 3 and the cathode 1. The limitation of thin-film layer suppressing unnecessary current not contributing to light emission is a functional limitation and hence has not been given patentable weight.

Regarding claims 16 and 29, Wakimoto discloses (column 2 lines5-8 Fig. 3) the thin-film layer 6b disposed between the cathode 1 and the light emitting layer 3.

Regarding claims 17 and 18 Wakimoto discloses (column 2 lines 59-66) the thin-film layer (electron injecting layer) is made of alkaline metal oxides and alkaline metal halides.

Claims 30 and 31 recite the same limitations as of claims 17 and 18 and hence are rejected for the same reason.

Regarding claims 19 and 32, Wakimoto discloses (column 2 lines 55,56, Fig.3) a thin film layer 4 disposed between the anode 2 and light emitting layer 3.

Claims 41 and 42 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 6,121,727 to Kanai et al.

Regarding claim 41 Kanai et al. disclose (column 3 lines 20-25, column 8 lines 18,19 Fig. 1) an organic electroluminescent device comprising organic luminescent layer 3 between the anode 2 and cathode 5 and a layer (cathode interface layer) 4 made of fluorides of alkaline earth metals (calcium, magnesium) disposed between the cathode and the light emitting layer.

Regarding claim 42 Kanai et al. disclose (column 15 line 60) lithium fluoride used as the material for the (cathode interface layer) layer between the cathode and light emitting layer.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2879

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 20,21,26,27 and 33,34,39,40 are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent 5,739,635 to Wakimoto.

Regarding claims 20 and 33 Wakimoto discloses (column 4 lines 38-40 Fig.4) an electroluminescent device comprising a hole injection (hole transport) layer 4a having high electric conductivity disposed between the light emitting layer and the anode.

Regarding claim 20 and 33, Wakimoto discloses the claimed invention except for the limitation of thickness of the hole injection layer being not less than 100nm. It has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 205 USPQ 215 (CCPA 1980). Thus, it would have been obvious to one of ordinary skills in the art at the time the invention was made to specify the thickness of the hole injection layer (4a) to be not less than 100nm, since discovering an optimum value of a result variable is considered within the skills of the art.

Regarding claims 21 and 34 Wakimoto discloses (column 4 line 12, Fig. 4) an electroluminescent device comprising a buffer layer (layer 4b) having electrical conductivity disposed between the light emitting layer and the anode.

Regarding claim 21 and 34, Wakimoto discloses the claimed invention except for the limitation of thickness of the buffer layer being not less than 100nm. It has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 205 USPQ 215 (CCPA 1980). Thus, it would have been obvious

to one of ordinary skills in the art at the time the invention was made to specify the thickness of the buffer layer (4b) to be not less than 100nm, since discovering an optimum value of a result variable is considered within the skills of the art.

Regarding claims 26 and 27 the Examiner notes that the claim limitation that "light emitting layer being formed by a printing method which is an ink-jet method " is drawn to a process of manufacturing which is incidental to the claimed apparatus. It is well established that a claimed apparatus cannot be distinguished over the prior art by a process limitation. Consequently, absent a showing of an unobvious difference between the claimed product and the prior art, the subject product-by-process claim limitation is not afforded patentable weight (see MPEP 2113). Therefore, it is the position of the examiner that it would have been obvious to one of ordinary skill in the art that the organic electroluminescent device disclosed by Wakimoto is at least a fully functional equivalent to the Applicant's claimed electroluminescent device having the light emitting layer formed by ink-jet method.

Claims 39 and 40 recite the same limitations as of claims 26 and 27 and hence are rejected for the same reason.

Claims 22,23,25 and 35, 36, 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent 5,739,635 to Wakimoto in view of U. S. Patent 6,111,356 to Roitman et al.

Referring to claims 22 and 23 Wakimoto discloses a light emitting layer including organic compounds. Wakimoto does not disclose light emitting layer including at least

one of polyfluorene and derivative of polyfluorene, poly(p-phenylenevinylene) and derivative of poly(p-phenylenevinylene).

Roitman et al. in analogous art of organic light emitting devices disclose (column 2 lines 56-59) the polymer layers of electroluminescent material include polyfluorene and polyphenylenevinylene. Roitman et al. further note (column 4 lines 44-56) that the layers formed of these polymers maintain their mechanical integrity, resistance to lifting off and electronic characteristics through the process of development and hence are preferred.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to include polyfluorene and polyphenylenevinylene in the light emitting layer as taught by Roitman et al. in the electroluminescent device of Wakimoto for their maintainance of mechanical integrity, resistance to lifting off and electronic characteristics through the process of development.

Claims 35 and 36 recite the same limitations as of claims 22 and 23 respectively and hence are rejected for the same reason.

Regarding claim 25 Roitman et al. disclose (column 3 lines 34-53) the light emitting layer formed by depositing a plurality of layers. It is further disclosed that for different colored device EL layer of each color is deposited separately and patterned such that different color pixels have different EL material.

Claim 38 recites the same limitations as of claim 25 and hence is rejected for the same reason.

Claim 24 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent 5,739,635 to Wakimoto in view of JP 10-36487.

Regarding claims 24 and 37 Wakimoto does not exemplify the degree of organic polymerization being at least two.

JP 10-36487 in relevant art of organic electroluminescent device discloses the degree of polymerization of the organic polymer is desirable between 1 and 2000. It is noted that depending on the degree of polymerization the fluorescent material of a polymer-based EL element can be produced by a simple process, has a well-defined structure and soluble in organic solvents for easy film formation. Regarding claim 24, Wakimoto in view of JP 10-36487 disclose the claimed invention except for degree of polymerization being at least 2. It has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use . *In re Leshin*, 125 USPQ 416. Thus, it would have been obvious to one having ordinary skills in the art at the time the invention was made to have selected the organic polymer of Wakimoto and JP 10-36487 to be at least 2, since the selection of known materials for a known purpose is within the skill of the art.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following prior art references are cited to further show the state of the art with respect to organic electroluminescent devices.

U. S. Patent 5,399,502 to Friend et al.

U. S. Patent 5,747,182 to Friend et al.

U. S. Patent 6,188,176 to Nakaya et al.

U. S. Patent 6,312,304 to Duthaler et al. disclose organic polymer having degree of polymerization from about 2 to about 10.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sikha Roy whose telephone number is (703) 308-2826. The examiner can normally be reached on Monday-Friday 8:00 a.m. – 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar D. Patel can be reached on (703) 305-4794. The fax phone number for the organization is (703) 308-7382.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

S.R.

Sikha Roy
Patent Examiner
Art Unit 2879



**NIMESHKUMAR D. PATEL
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800**